Historic American Engineering Record

Simpson Creek Bridge
(Bridgeport Lamp Chimney Factory)
Bridgeport
Harrison Co.
West Virginia

HAER WV-23

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WVA,
17-BRIPO,
1-

REDUCED 8" x 10" DRAWINGS

Addendum to:
Bridgeport Lamp Chimney Company
Simpson Creek Bridge
Spanning Simpson Creek Route 58 Vic.
Bridgeport
Harrison County
West Virginia

WV-23

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17-BRIPO,
1-

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

Historic American Engineering Record
National Park Service
Deaprtment of the Interior
Washington, D.C. 20240

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HISTORIC AMERICAN ENGINEERING RECORD

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BRIDGEPORT LAMP CHIMNEY COMPANY,

SIMPSON CREEK BRIDGE

Date: 1924

Location: Spanning Simpson Creek, Rte. 58, Bridgeport, Harrison County, West Virginia.

Engineer: Frank D. McEnteer

Significance: Simpson Creek Bridge is a surviving example of the work of Frank McEnteer, one of West Virginia's most important builders of reinforced concrete structures.

Historian: Dennis Zemballa.

Transmitted: Dan Clement, 1984.

This structure furnishes insight into the early industrial development of the Clarksburg area and of the State as a whole. Founded in 1904, the Bridgeport Lamp Chimney Company was only one of many which chose to locate in West Virginia to take advantage of recent developments favorable to industry. Most important in terms of the glass industry was the prospect of a plentiful and inexpensive supply of natural gas as fuel. This had been a traditional problem in the glass trade and was primarily responsible for its transient character. The First World War proved to be a great stimulus to the company's business. ln 1923, the plant was expanded to 48 shops producing a total of 24,000 chimneys per day and a warehouse was built on the other side of Simpson Creek to provide adequate storage facilities. In 1924, the reinforced concrete arch bridge was built to provide a connection from the plant to this warehouse.

The real significance of this bridge lies in its existence as an example of the work of Frank D. McEnteer. A native of Pennsylvania, McEnteer played a major role in the industrial expansion which was a result of the increased utlization of West Virginia's coal, gas, and oil resources. During the building boom which accompanied this expansion, he was primarily responsible for making the technology of reinforced concrete an indispensible part of the grammar of bridge and building construction. After receiving his degree from Harvard University in 1905, McEnteer worked for various companies in Hamilton, Ontario; Detroit and Pittsburgh before settling in Clarksburg in 1912. ln that year, he built the Palace Furniture Company (still standing), the first reinforced concrete building in West Virginia. On January 23, 1914, McEnteer formed The Concrete Steel Bridge Company of which he served as president and general manager. From that date until 1932 when the company was dissolved in the throes of the depression, McEnteer built hundreds of reinforced concrete buildings and bridges. Aside from supplying a major part of West Virginia's highway bridges, the company built bridges in New York, Pennsylvania, North Carolina, Tennessee, and a large number of Florida during the state's land boom in the 1920's. ln effect, the Bridgeport Lamp Chimney Company bridge is an example of the work of West Virginia's most important early builder of reinforced concrete structures and one of the most important in the country.

HISTORICAL REPORT

lt is not easy to find a proper structural category in which to put the concrete span across Simpson Creek in Bridgeport. It could be referred to as a truss, an arch, a bowstring, a tied arch or a Vierendeel Truss. It even has some of the qualities of a plate girder or deep beam, at least at the ends. If the connections between the vertical members and the chords are assumed to be unable to transfer moment, then the structure would have to be considered a tied arch. If these connections are assumed to provide full continuity, then the bridge takes on the appearance of a Vierendeel truss. The amount and placement of reinforcing can only be guessed at, except where spalling his exposed the bars, so the designer's assumptions are not known, but this writer would opt for the pinned connections.

A shear diaphragm has been placed in the first panel on either end. Exposed shear reinforcing shows stirrups forming out at varying angles. Those closer to the support make a flatter angle with the horizontal. This indicates a basic understanding of shear on the part of the designer. Perhpas he had observed the orientation of diagonal tension cracks in beams and placed the vertical reinforcing in the shear panel accordingly.

The arch is very nearly circular with a radius of 71' or 72' feet. Neither the abutments nor the joints between the bridge and the abutments appear to be designed to withstand the horizontal thrust always present in an arch, so the lower chord, or perhaps the entire floor, acts as a tension tie.

The arch has two 1 1/4" diameter refinrocing bars exposed on the underside. One would guess that there are matching bars in the top, but whether there are more than four bars in the arch is not known. The bottom steel seems to have been placed with pitifully little cover, certainly not enough to staisfy percent American Concerete Institute requirements. In some places it looks like the bars were lying on the formwork when the concrete was placed. No reinforcing is exposed in the top of either the arch or the floor system.

The reinforcing itself is unusual in appearance. One would expect to find in a bridge of this vintage, a deformed square bar or a twisted square bar. The reinforcing of the Bridgeport span appears to be a square bar whose edges have been dimpled or crimped.

The clear span between abutments is 67'. The rise to the extrados of the arch is 9'-6, making the ration of rise to span about 1 to 7. The two arches are joined at the top with a strut and the vertical clearance is 8' - 5". The horizontal clearance between the sides is 8' - 3".